

Application No.: 09/980,910

Docket No.: NY-DNAG 224-US

IN THE CLAIMS

1. (currently amended) A method Method for applying a phosphate coating ~~coatings~~ to a metallic surface comprising surfaces by wetting the surface with an aqueous, acidic phosphating solution and ~~subsequent~~ drying of the phosphating solution on the coated surface, ~~usually without subsequent rinsing, characterised in that wherein~~ the phosphating solution comprises contains

- 26 to 60 g/l of zinc ions,
- 0.5 to 40 g/l of manganese ions, and
- 50 to 300 g/l of phosphate ions, calculated as P_2O_5 .

2. (currently amended) A method Method for applying a phosphate coating ~~pyhosphate coatings~~ to a metallic surface comprising surfaces by wetting the metallic surface with an aqueous, acidic phosphating solution and ~~subsequent~~ drying of the phosphating solution, ~~wherein usually without subsequent rinsing, characterised in that~~ the phosphating solution comprises contains

- 10 to 60 g/l of zinc ions, ~~or 0 to 60 g/l of zinc ions in the case of zinc rich surfaces before the wetting,~~
- 0.5 to 40 g/l of manganese ions,
- 50 to 300 g/l of phosphate ions, calculated as P_2O_5 ,
- 0.5 to 120 g/l of peroxide ions, calculated as H_2O_2 and/or
- 0.5 to 50 g/l of polymers, copolymers and/or cross polymers.

3-26 (canceled)

Application No.: 09/980,910

Docket No.: NY-DNAG 224-US

27. (previously presented) A method according to claim 1, wherein the phosphating solution is free or substantially free of nickel or contains up to 20 g/l of nickel ions.

28. (previously presented) A method according to claim 1, wherein the phosphating solution contains polymers, copolymers and/or cross polymers, in particular of N-containing heterocyclic compounds, preferably of vinyl pyrrolidones.

29. (previously presented) A method according to claim 1, wherein a phosphating solution is used in which the ratio of the sum of cations to the phosphate ions, calculated as P_2O_5 , lies in the range of 1:1 to 1:8.

30. (previously presented) A method according to claim 1, wherein an amount of phosphating solution in the range from 1 to 12 ml/m² is applied to the metal parts for drying.

31. (previously presented) A method according to claim 1, wherein a layer having a layer weight for the precipitated and dried phosphate layer in the range from 0.1 to 5 g/m² is formed with the phosphating solution.

32. (previously presented) A method according to claim 1, wherein the phosphating solution is applied to the metal part by spraying, by roller application, by flooding and subsequent squeezing off, by splashing and subsequent squeezing off or by dipping and subsequent squeezing off.

33. (previously presented) A method according to claim 1, wherein the liquid film formed on the metal part with the phosphating solution is dried on the surface of the metal part at temperatures in the range from 20 to 120°C with respect to PMT temperatures.

34. (previously presented) A method according to claim 1, wherein a phosphate layer having the following composition is formed:

free or substantially free of nickel or up to a content of 10% by weight nickel;

5 to 40% by weight Zn,

Application No.: 09/980,910

Docket No.: NY-DNAG 224-US

1.5 to 14% by weight Mn, and
20 to 70% by weight phosphate, calculated as P_2O_5 .

35. (previously presented) A method according to claim 1, wherein after drying a first phosphating solution wherein the metal parts are wetted with a second aqueous, acidic phosphating solution, this second solution being free or substantially free of nickel, or containing up to 20 g/l of nickel ions in the phosphating solution and 0 to 20 g/l of zinc ions, 0 to 5 g/l manganese ions, and 5 to 50 g/l of phosphate ions, calculated as P_2O_5 .

36. (previously presented) A method according to claim 1 wherein before wetting with the first and/or second phosphating solution, the metal parts are wetted with an activating solution or activating suspension.

37. (previously presented) A method according to claim 1 wherein the first phosphating solution contains at least 0.3 mg/l of copper ions, and the second phosphating solution which is possibly used contains 0.1 to 50 mg/l of copper ions.

38. (previously presented) A method according to claim 1 wherein a first and/or second phosphating solution is used in which the A-value, as ratio of the free acid to the total content of the phosphate ions, lies in the range from 0.03 to 0.6.

39. (previously presented) A method according to claim 1 wherein the first and/or second phosphating solution contains at least one catalyst such as, for example, a peroxide, a substance based on nitroquinidine, based on nitrobenzene sulphonic acid or based on hydroxylamine, a chlorate, a nitrate, a perborate or an organic nitro compound, such as p-nitrotoluene sulphonic acid.

40. (previously presented) A method according to claim 1 wherein the first and/or second phosphating solution contains a peroxide admixture, preferably H_2O_2 in a concentration in the range from 1 to 100 g/l, calculated as H_2O_2 .

Application No.: 09/980,910

Docket No.: NY-DNAG 224-US

41. (previously presented) A method according to claim 1 wherein the first and/or second phosphating solution has a content of at least one compound based on perboric acid, lactic acid, tartaric acid, citric acid and/or a chemically related hydroxy carboxylic acid.

42. (currently amended) A method according to claim 1 wherein the first and/or second phosphating solution has a content of ions of aluminum, boron, iron, hafnium, molybdenum, silicon, titanium, zirconium, fluoride and/or complex fluoride, in particular 0.01 to 5 g/l of fluoride in free and/or bound form.

43. (previously presented) A method according to claim 1 wherein the first and/or second phosphating solution is applied at a temperature in the range from 10 to 80°C.

44. (previously presented) A method according to claim 1, wherein a passivating solution is applied directly to a phosphate layer, in particular by spraying, dipping or rolling.

45. (previously presented) A method according to claim 1, wherein the first and/or second phosphate layer which has died on to the metal part is wetted with an oil, a dispersion or a suspension, in particular a deforming oil or anticorrosive oil and/or a lubricant.

46. (previously presented) A method according to claim 1, wherein an oil coating or lubricant coating which is possibly present is removed from or out of the first or second phosphate layer respectively.

47. (previously presented) A method according to claim 1, wherein the metal parts which have been provided with a first and/or second phosphate layer are coated with a lacquer paint, with another type of organic coating and/or with a layer of adhesive, and possibly deformed, in which case the metal parts which have been coated in this way can additionally be glued, welded, and/or connected in another way to other metal parts.

48. (previously presented) A method according to claim 23, wherein the metal parts which have been provided with a first and/or second applied phosphate layer are coated with a

Application No.: 09/980,910

Docket No.: NY-DNAG 224-US

coating corresponding to claim 23 either before or not until after the deformation and/or assembly.

49. (new) The method of claim 1, wherein the dried phosphate layer has a thickness of from 0.2 to 5 g/m².

50. (new) A method according to claim 42 wherein the first and/or second phosphating solution has a content of 0.01 to 5 g/l of fluoride in free or bound form.